

Patent Application 09/715,161  
Docket No. P14123USAMENDMENT TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (Currently amended) In a cellular telecommunications network, a method for Mobile Internet Protocol (MIP) registration between a Mobile Node (MN) and a Packet Data Serving Node (PDSN), the method comprising the steps of:

establishing a Point-to-Point Protocol (PPP) connection between the MN and the PDSN;

responsive to the establishment of the PPP connection, starting a PPP timer set to expire after a predetermined period of time;

attempting an MIP registration of the MN with the PDSN; and

detecting if the MIP registration is successful;

upon detecting an unsuccessful MIP registration of the MN with the PDSN, keeping alive the PPP connection between the MN and the PDSN until an expiration of the predetermined period of time of the PPP timer;

detecting if a new MIP registration request is received by the PDSN from the MN before the expiration of the predetermined period of time; and

if a new MIP registration request is received by the PDSN from the MN before the expiration of the predetermined period of time, resetting the PPP timer to the predetermined period of time

~~whereby the MN can attempt at least one additional MIP registration during the predetermined period of time following the unsuccessful MIP registration.~~

Claim 2 (Original) The method claimed in claim 1, wherein the step of attempting an MIP registration, i) is performed responsive to a receipt at the MN of an agent

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advertisement message received from the PDSN, and ii) comprises sending from the MN to the PDSN an MIP registration request.

**Claim 3 (Original)** The method claimed in claim 1, wherein the predetermined period of time is comprised in a range of one second to ten minutes.

**Claim 4 (Original)** The method claimed in claim 3, wherein the predetermined period of time is comprised in a range of one minute to 5 minutes.

**Claim 5 (Canceled)**

**Claim 6 (Original)** The method claimed in claim 1, further comprising the step of: terminating the PPP connection if a new MIP registration request is not received by the PDSN from the MN before the expiration of the predetermined period of time.

**Claim 7 (Currently amended)** An Internet Protocol-based (IP-based) cellular telecommunications system comprising:

a Mobile Node (MN); and

a Packet Data Serving Node (PDSN) connected to the MN through a Point-to-Point Protocol (PPP) connection;

wherein responsive to an establishment of the PPP connection, the PDSN starts a PPP timer set to expire after a predetermined period of time, detects if an Mobile Internet Protocol (MIP) registration is successful and wherein upon detecting an unsuccessful Mobile Internet Protocol (MIP) registration attempt of the MN with the PDSN, the PDSN keeps alive the PPP connection between the MN and the PDSN until an expiration of the predetermined period of time of the PPP timer, further detects if a new MIP registration request is received from the MN before the expiration of the predetermined period of time, and if a new MIP registration request is received from the MN before the expiration of the predetermined period of time, resets the PPP timer to the predefined period of time.

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Claim 8 (Original) The system claimed in claim 7, wherein the IP-based cellular telecommunications system is a Code Division Multiple Access (CDMA) 2000 cellular telecommunications system.

Claim 9 (Original) The system claimed in claim 7, wherein:

the PDSN sends an agent advertisement message to the MN;  
responsive to a receipt at the MN of the agent advertisement message sent by the PDSN, the MN sends an MIP registration request message for attempting to register with the PDSN.

Claim 10 (Original) The system claimed in claim 7, wherein the predetermined period of time is comprised in the range of one second to ten minutes.

Claim 11 (Original) The system claimed in claim 7, wherein the predetermined period of time is comprised in the range of one minute to 5 minutes.

Claim 12 (Canceled)

Claim 13 (Original) The system claimed in claim 1, wherein the PDSN terminates the PPP connection if a new MIP registration request is not received from the MN before the expiration of the predetermined period of time.

Claim 14 (Currently amended) A Packet Data Serving Node (PDSN) comprising:

a Point-to-Point Protocol connection (PPP) timer started upon establishment of a PPP connection between the PDSN and a Mobile Node (MN), the PPP timer being set to expire after a predetermined period of time; and  
a PPP stack enabled upon the establishment of the PPP connection; and

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a PDSN/Foreign agent functionality for performing a Mobile Internet Protocol (MIP) registration of the MN with the PDSN and for detecting if the MIP registration is successful; and

wherein upon detecting an unsuccessful MIP registration attempt of the MN with the PDSN, the PDSN/Foreign agent keeps the PPP stack enabled and the PPP connection alive between the MN and the PDSN until an expiration of the predetermined period of time of the PPP timer, detects if a new MIP registration request is received from the MN before the expiration of the predetermined period of time; and if a new MIP registration request is received from the MN before the expiration of the predetermined period of time, resets the PPP timer to the predefined period of time.

Claim 15 (Original) The PDSN claimed in claim 14, wherein at least one of the PPP timer, the PPP stack, and the PDSN/Foreign agent are software modules.

Claim 16 (Original) The PDSN claimed in claim 14, wherein at least one of the PPP timer, the PPP stack, and the PDSN/Foreign agent are hardware modules.

Claim 17 (Original) The PDSN claimed in claim 14, wherein at least one of the PPP timer, the PPP stack, and the PDSN/Foreign agent are software modules running on an operating system itself running on top of a hardware platform.

Claim 18 (Original) The PDSN claimed in claim 14, wherein the PDSN operates in a Code Division Multiple Access (CDMA) 2000 cellular telecommunications system.

Claim 19 (Original) The PDSN claimed in claim 14, wherein:

the PDSN/Foreign agent sends an agent advertisement message to the MN upon establishment of the PPP connection between the PDSN and the MN; and

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responsive to a receipt at the MN of the agent advertisement message, the MN sends an MIP registration request message for attempting to register with the PDSN/Foreign agent.

Claim 20 (Original) The PDSN claimed in claim 14, wherein the predetermined period of time is comprised in the range of one second to ten minutes.

Claim 21 (Original) The PDSN claimed in claim 14, wherein the predetermined period of time is comprised in the range of one minute to 5 minutes.

Claim 22 (Canceled)

Claim 23 (Original) The PDSN claimed in claim 14, wherein the PDSN/Foreign agent terminates the PPP connection if a new MIP registration request is not received from the MN before the expiration of the predetermined period of time.

Claim 24 (Currently amended) In a cellular telecommunications network, a method for Mobile Internet Protocol (MIP) registration between a Mobile Node (MN) and a Packet Data Serving Node (PDSN), the method comprising the steps of:

establishing a Point-to-Point Protocol (PPP) connection between the MN and the PDSN;

responsive to the establishment of the PPP connection, starting a PPP timer set to expire after a predetermined period of time;

attempting an MIP registration of the MN with the PDSN;

detecting if the MIP registration is successful; and

upon detecting an unsuccessful MIP registration of the MN with the PDSN:

sending from the PDSN to the MN an MIP registration reply for informing the MN that the MIP registration was unsuccessful;

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keeping alive the PPP connection between the MN and the PDSN until an expiration of the predetermined period of time of the PPP timer; and

responsive to a receipt of the MIP registration reply at the MN, attempting an additional MIP registration of the MN with the PDSN by sending an additional MIP registration request from the MN to the PDSN, detecting if the additional MIP registration request is received by the PDSN from the MN before the expiration of the predetermined period of time and if the additional MIP registration request is received by the PDSN from the MN before the expiration of the predetermined period of time, resetting the PPP timer to the predetermined period of time wherein the steps of attempting an MIP registration and the step of attempting an additional MIP registration comprise sending from the MN to the PDSN an MIP registration request.

Claim 25 (Original) The method claimed in claim 24, wherein the predetermined period of time is comprised in a range of one second to ten minutes.

Claim 26 (Original) The method claimed in claim 25, wherein the predetermined period of time is comprised in a range of one minute to 5 minutes.

Claim 27 (Canceled)

Claim 28 (Original) The method claimed in claim 24, further comprising the step of:

terminating the PPP connection if the additional MIP registration request is not received by the PDSN from the MN before the expiration of the predetermined period of time.